CHANNEL FOUR TELEVISION

LOW TECH

by Rick Ball

PRODUCED BY NETWORK FOR CHANNEL 4

LOW TECH

by Rick Ball

These plans, with drawings by Paul Cox, describe how we made the furniture for “Low Tech”, a series of six programmes, directed by Terry Braun and produced by Georgina Denison (Malone Gill Productions), first shown on Channel Four Television in March-April 1985. The plans are easy to adapt to your own needs, likes and materials. Further information is given in the book “Low Tech” by Rick Ball and Paul Cox (Century, £6.95), published to coincide with the television series.

THE TUBULAR TABLE

Materials	***Source***
Enough cardboard tubes for 16 legs and seven horizontals	skip; street; end of rolls from clothing manufacturer, carpet shop or printer. Buy new from dealers under “Tube Manufacturers” in “Yellow Pages”
Top: one flush door	skip (free) or demolition yard (about £2)
Woodworking adhesive	

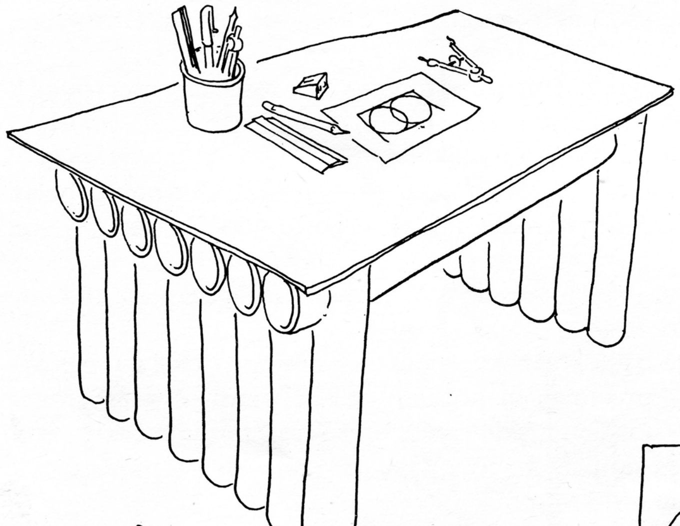
The table is made from cardboard tubes, joined together on the log cabin principle. It’s very strong, and once you’ve cracked the jointing system it’s simple to make, as all joints are identical.

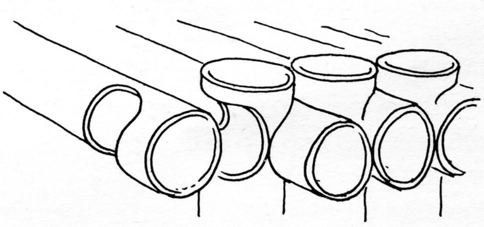
We used eight 9ft tubes, for legs 28in high and a 42in top — vary dimensions as you like. The tubes must all be the same diameter; ours were 3in diameter.

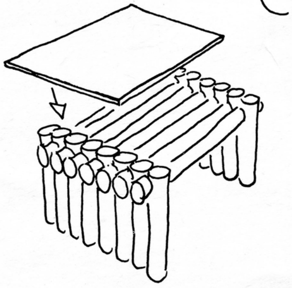
Cut tubes to length with a saw or knife. To cut ends square, wrap paper round the tube and use the edge as a marking guide. The key to a stable table is in marking up the shape to be cut out of the tubes. A paper pattern simplifies the job, so we’ve illustrated one. To make one, find the distance round the tube by wrapping paper round it. Now fold the paper in half and draw a line that long on squared paper. At each end, draw a line at right angles to it. Put la tube on the pattern and draw around it in the two positions shown in the drawing. Cut out the shaded area — that’s your pattern for every tube. Just put it on the tube, mark, and cut out the shape with a knife or hacksaw blade. The holes are cut 1in from one end of every leg and 4in from each end of the horizontals. The holes in the horizontals must be aligned so the legs stand straight. To align them, put the tube on a flat surface, place a straight piece of wood alongside it and use this to rule a line along the tube. If the edge of both cuts touches this line, they will be correct.

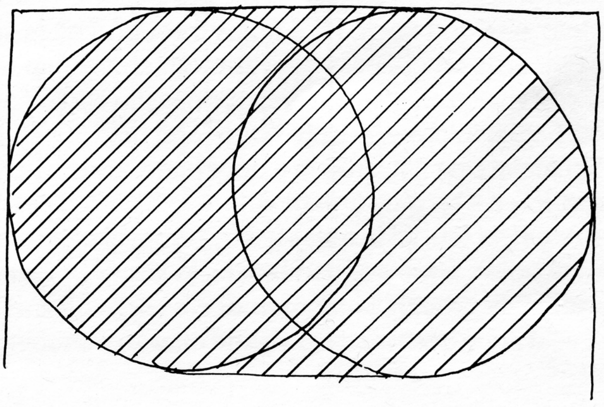
When the tubes are ready, assemble the table loosely to check it fits together, and make any adjustments. Smear woodworking adhesive on all points where tubes touch, and assemble the table in one. Check legs are straight and vertical; they may try to splay inwards — stop this by holding them apart with a plank of wood.

The top makes the table flat. A flush door is strong and light. Saw the door to length (42in) and stop wobbles by glueing and pinning a wooden batten in the open end (you’ll find the perfect batten in the sawn-off part of the door). Stop the top sliding on the base by glueing a piece of wood at each corner to sit in the open top of the corner tubes.









THE LOW TECH SOFA

Materials	***Source***
Back 8 Seat: two matching panel doors	Skip, or buy secondhand from demolition site/yard
Arms: two lengths of joist (7 × 2 × 19½ in for ours)	Skip — check for dry rot and woodworm; or buy from demolition site/yard
Metal angle bracket (Dexion) about 50 in long	skip
or three cast-iron hinges	remove from the doors
Sides: two wine crates (3 if you want shelves)	off licence (usually free) or wine warehouse
Two battens (ours are l × 1 × 19in)	skip
Two battens(1 × 1 × 12in)	skip
Legs: Two pieces of scrap timber to fit inside cardboard tubes	unused part of the door
Two cardboard tubes (ours are 3½in diameter, 15½ long)	skip, printer, carpet shop, clothing manufacturer
About 2 doz. lin screws	
Four 3in screws	
White woodworking adhesive (optional)	

The Low Tech sofa is a two—seater designed to use a number of waste materials. There's nothing complicated in the construction.

Check doors are flat by looking along edge, and examine top and bottom for damage.

Remove any hardboard panels; lever off mouldings where you are going to saw; pull out protruding nails with claw hammer or pincers; unscrew locks, hinges and handles.

Mark and saw both doors to size as in drawing (use the whole door if you want a bed-settee).

Cut metal bracket to length with a hacksaw.

Screwbracket to central rail of back —- six lin screws should be adequate. Driving screws is easier if you start the hole with a bradawl or spike.

Lay the back on the floor, place seatin position and screw the bracket to it, again using six lin screws.

The Legs: Mark up two wooden legs for cutting and saw to length. Llsing a square to mark cutting line round leg helps you cut a square end.

Cut cardboard tubes to same length. To mark straight line round tube, wrap a piece of paper round it as a guide.

File down corners of wooden legs until they fit snugly inside the tube.

We fitted legs 8in from each end. Tubes should not project beyond front of seat. Drill pair of holes through seat and into top of each leg. Drive home 3in screws. (Wooden dowels are a good, strong, cheap alternative.)

Measure the two arms (joists) — they are the full depth of the sofa. Mark them using a square and saw to length.

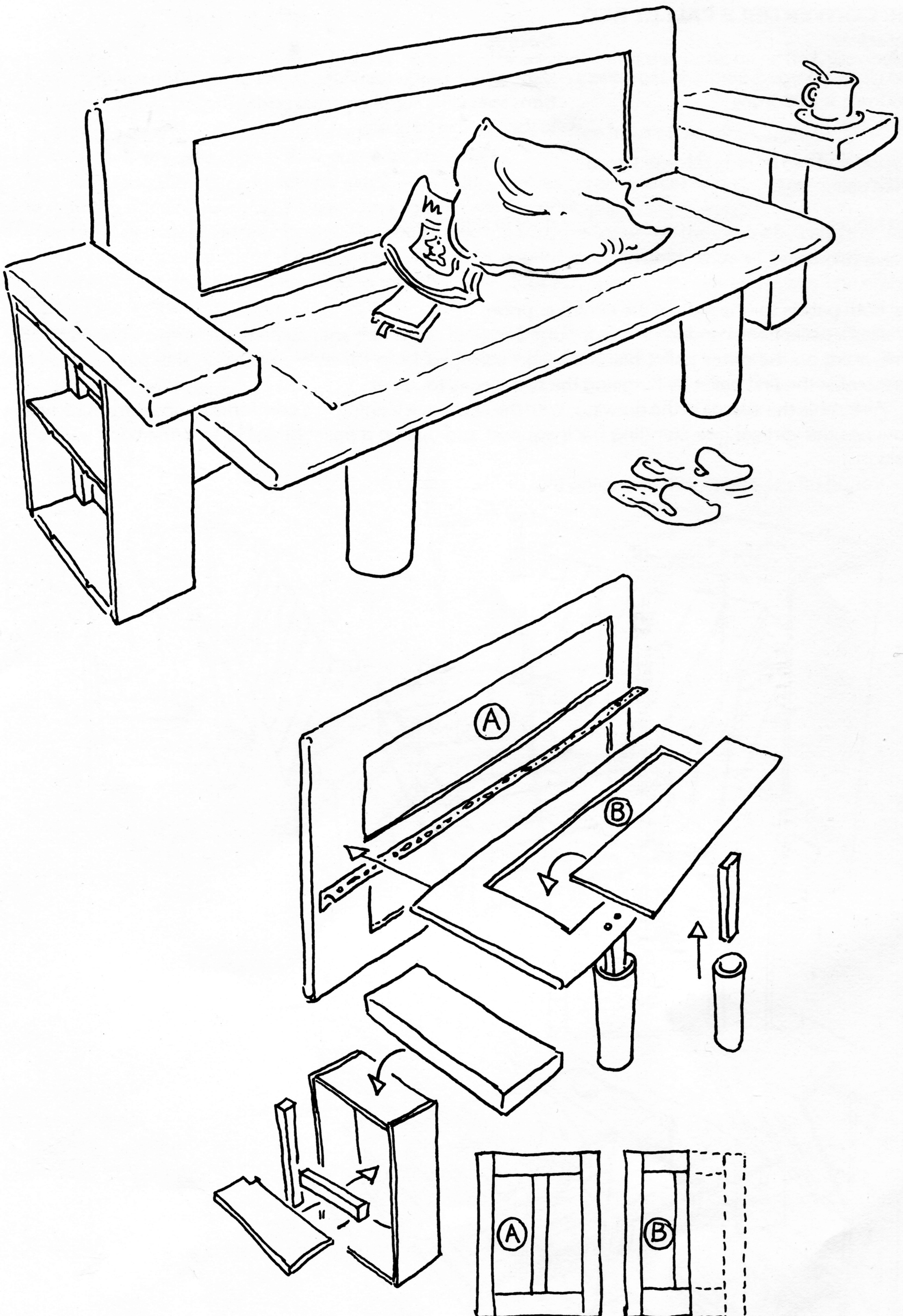
Cut battens (approx. 1 × lin) to hold crates to back and seat of sofa (see drawing). Drill three holes through each batten, as wide as your screws. Put crates in position at each end of sofa, smear woodworking adhesive on battens, put battens in position inside crates and screw through batten and crate into seat and back. Pilot holes through crates simplify the job. Wipe glue off with wet rag before it dries. Put arms on crates; screw through crates into arms.

If you want a shelf in the crates, prise the end off another wine crate, saw out corner so it will fit around vertical batten in crate, push it home and hold it with panel pins hammered through crate sides.

To make seat flat, drop in a door panel and raise it to seat level on blocks of wood glued and pinned to the seat. Fix it with glue and pins.

For a neat job, fill in holes left by removal of hinges, locks and handles, using Polyfilla or plastic wood for small holes. Glue wooden blocks in larger holes — hold them in place with masking tape while glue dries, and tidy up with sandpaper or chisel. Sand it all smooth.

If seat edge seems sharp, round off with a shaping tool (Surform) or file. Do the same at the top of the back.


A
B
A
B

TI-IE CONVERTIBLE PALLET BED

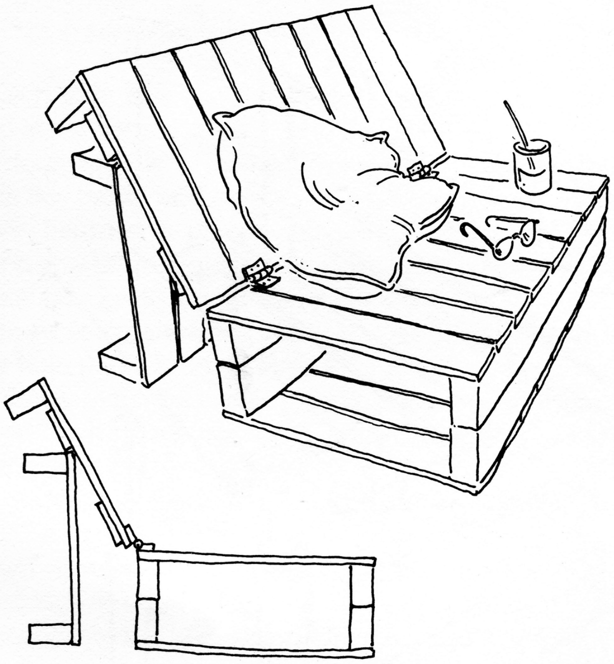
Materials	*Source*
Two close-boarded, single-sided pallets 1000mm × 1000mm (39 × 39in)	Skip, street, market, builder's yard, or secondhand (about £2) from specialist supplier, listed under "Pallet 8 Case Makers" in the "Yellow Pages"
Support and two boards salvaged from a third pallet	
Two hinges door in skip	
Twelve 1in screws	

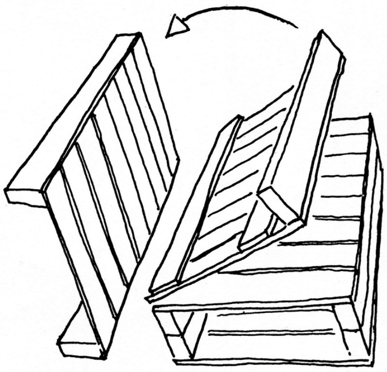
Saw both pallets to one side of the centre support.

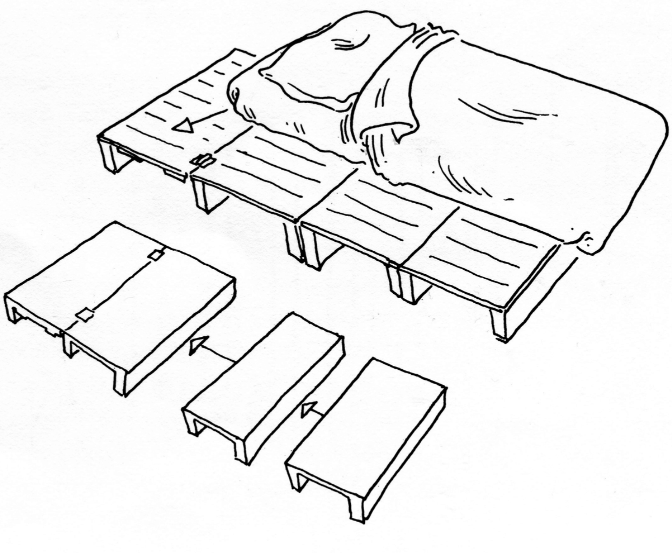
Nail a pallet board under the unsupported edge of one of the smaller pieces to stop it wobbling. At the same point on the other pallet nail a support salvaged from the spare pallet, so this piece will sit flat. Reassemble the first pallet by hingeing the two pieces together.

Assemble the seat as in the drawing. With the seat back leaning in a comfortable position, mark where it touches the vertical free-standing back support and nail on a pallet board to lock the back support in position.

Round off the edges with a shaping tool or file.







WINE CRATE STORAGE

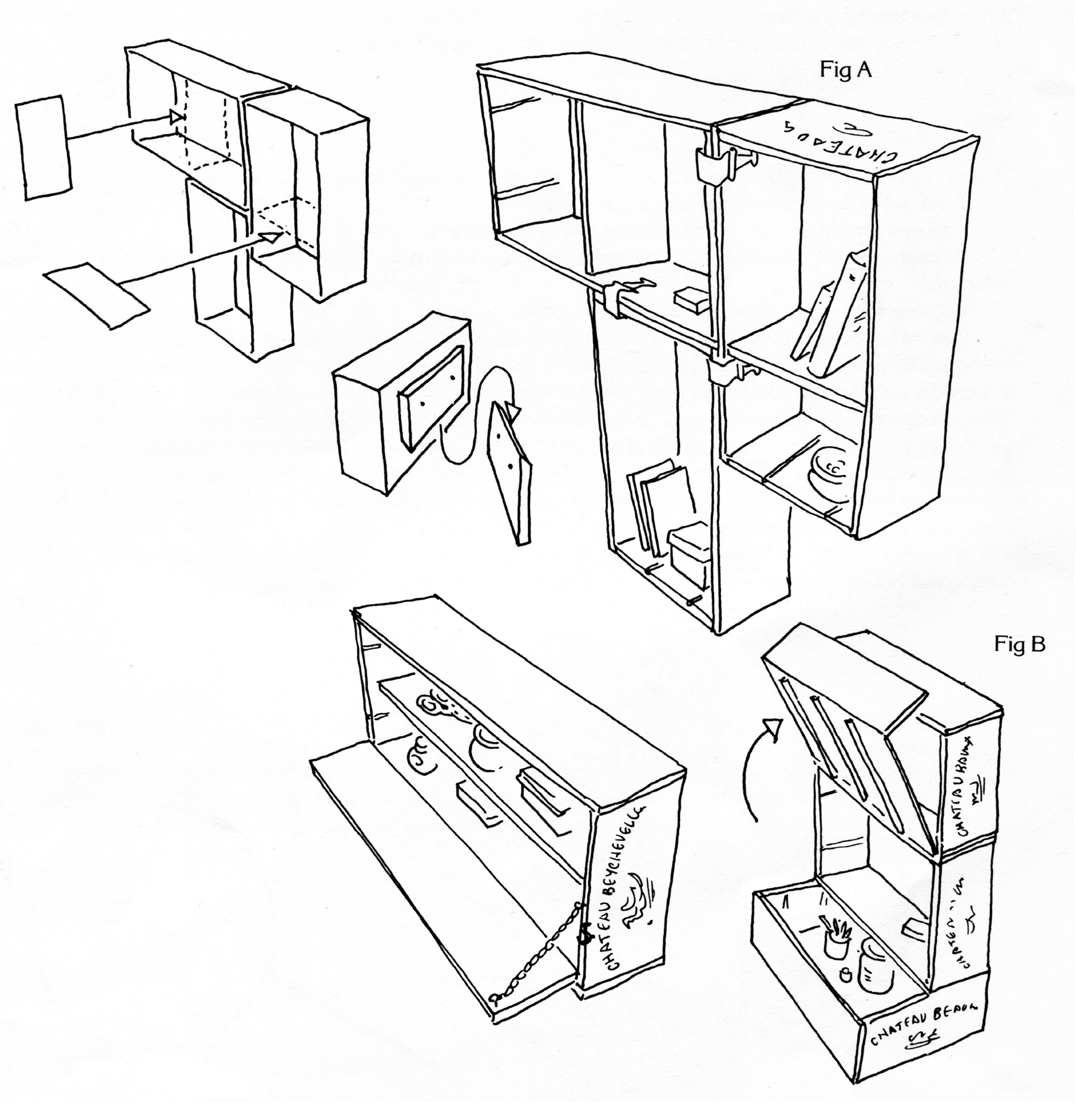
We used wine crates in Programme 5 to show a number of ways of using the same basic box. Obviously there are other boxes and other combinations — design a system to fit your possessions. The dimensions of the standard wine crate are 19¾ × 13 × 7in.

Crates are easy to join with pins or bulldog clips. They come free from off licences, from large hotels or from wine warehouses, where they may cost about 50p.

We disguised the boxes in several ways — pinning shelves (crate bases) and dividers (crate ends) inside or fitting doors (bases). The system in Fig A shows the principle.

The Fig B system uses three boxes. The shelf in the top box, the “door” on the centre box and the “lid” on the lower box are made from crate bases. The door is reinforced by thin strips of wood glued and pinned behind. The door and lid are hinged together. The door is hinged to the box at the top. The crates themselves are screwed together.

The mounting system holding the crates to the wall uses two thin angled battens, made from the base of a crate. The top batten is glued and pinned to the back of the crate, the other is screwed to the wall.



THE VERY BASIC BED

Materials	*Source*
Sides: two 7in-wide floorboards, 2in longer than your mattress when cut down	Demolition site/yard or skip; secondhand building materials supplier
Ends: two 7in floorboards as wide as your mattress when cut down	
Top: twelve planks (34 × 4 × ¾in for our bed)	take them off a wooden pallet (free in skip/street)
Legs: four pieces 12 × 3 × 2in or similar	skip/demolition site
Two battens to support top boards (74 × 1 × 1in)	skip/demolition site
Twelve 1in screws	
White woodworking adhesive *(the above two items not needed if you nail boards on top of frame)*	
Eight bolts at least 3in long (optional)	
Nails	

This single bed, from Programme 2, is cheap, straightforward to make, and it works.

Take old nails out of planks with a claw hammer.

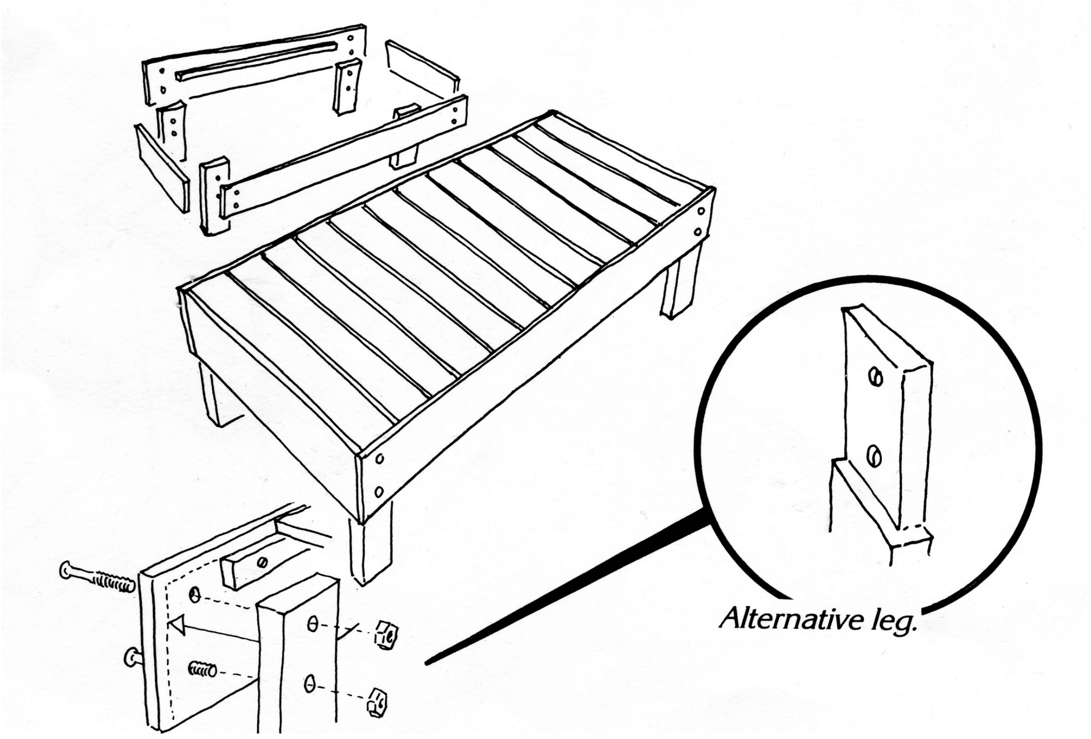
Saw one end of all four planks square, using a square to mark up.

Measure correct distances from squared ends, mark up using the square and saw the sides and ends to length.

Cut four legs of equal length, with square ends.

Place a leg at each end of each long board, with the legs ¾in (the thickness of the pallet boards) below the board edge and ¾in (thickness of end board) in from the end. Taking care to keep legs at right angles to boards, nail the boards to the legs, OR drill two holes through side and legs to take a pair of bolts. Wooden dowels are another strong, cheap alternative. Fix a batten between the legs at each side, again ¾in below the edge. The strongest fixing is called "glue and screw" — drill six evenly spaced pilot holes the same diameter as your screws through the batten, smear the batten with adhesive and screw it to the bed. Join an end board to each side, with nails, screws or dowels. Now complete the frame assembly. This is easier with the bed upside down.

We used twelve pallet boards for the top, with gaps between. You can improve the corner joints by cutting out housings at the corners on which the frame sits (see drawing).



THE PALLET BED

Materials	***Source***
Six close-boarded, single-sided pallets 1000 × 1000mm (39 × 39in)	Skip, street, market, builder's yard, or secondhand (about £2) from specialist supplier, listed under "Pallet & Case Makers" in the "Yellow Pages"
One open-boarded, double-sided pallet, 1000 × 1000mm	
Bolts (optional)	

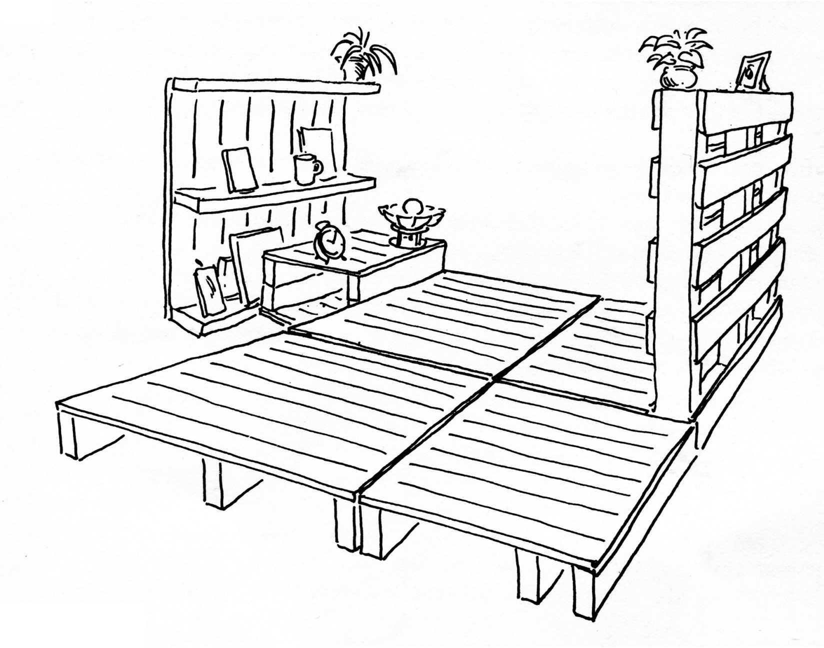
Pallets make a good fast bed, healthier than a damp mattress on the floor. We designed this unit to fit the available space and to show the versatility of pallets.

Cut one pallet alongside centre support. When placed by a complete pallet, this is the width of a double mattress. Another identical pair makes the perfect base for a double bed. Our design adds variety — a support salvaged from another pallet is nailed under the overhang on the sawn section of the fourth pallet. It's not crucial. The bedside table is two quarter pallets.

You can bolt the pallets together through the supports for added stability; just drill a hole through both pallets and fix a nut, bolt and washers.

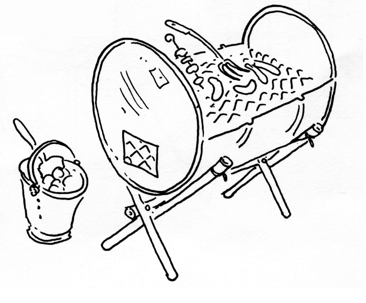
The free-standing pallet could fall over unless it's fixed to the wall. Take care with partition walls — fix to one of the timber uprights. Nail, screw or bolt it to the adjacent pallet at the base.

You can sand the pallets smooth, but it's hard work. Otherwise, burn off the splinters with a blowlamp and clean up with a suede brush; then varnish or wax. Round off the edges with a file or Surform to protect your legs.



THE BARBECUE

Half the drum is cut away, and a ventilation hole cut at one end. The food lies on an expanded metal grille inside the drum. The cradle can be made of gas pipe or timber, both common finds in skips or demolition sites. The heat of the barbecue burns off any rust in the drum.



For information on cutting oil drum see p8.

THE OIL DRUM SEAT

Materials	*Source*
44 gallon (200 litre) oil drum	garage, building site, paint shop, drum cleaner (cost about £2)
½in-thick plywood or similar, about 24 × 24in	skip, or offcut from woodyard
pipe insulation foam, about 6ft	building site skip, d.i.y. shop
Three nuts and bolts, 1 ½in long	

Oil drums are a major resource for the world's low technicians. The design for the barbecue in Programme 4 (see P97) comes from Kingston, Jamaica, where it's the standard model for street food stalls. The barrel chair is an original. Cutting metal doesn't demand great skill or long practice — use a drill to get started, then it's just like cutting paper with scissors, but much, much slower.

Avoid drums if you don't know what's been in them — some contain dangerous chemicals. Cleaned drums are safest. Leaving any empty drum outdoors for a few days, on its side with the two screw tops off, to allow fumes to evaporate.

Marking the drum. Cut out end with drainage holes, to leave a flat base. The pattern drawing (each square represents 3 X 3in) shows the cutting line for half the drum; the other half is identical. Scratch cutting lines on drum with a nail. Mark straight lines at seat level by hammering two nails through a piece of wood 17in apart; hook one end over drum lip and score line with the other.

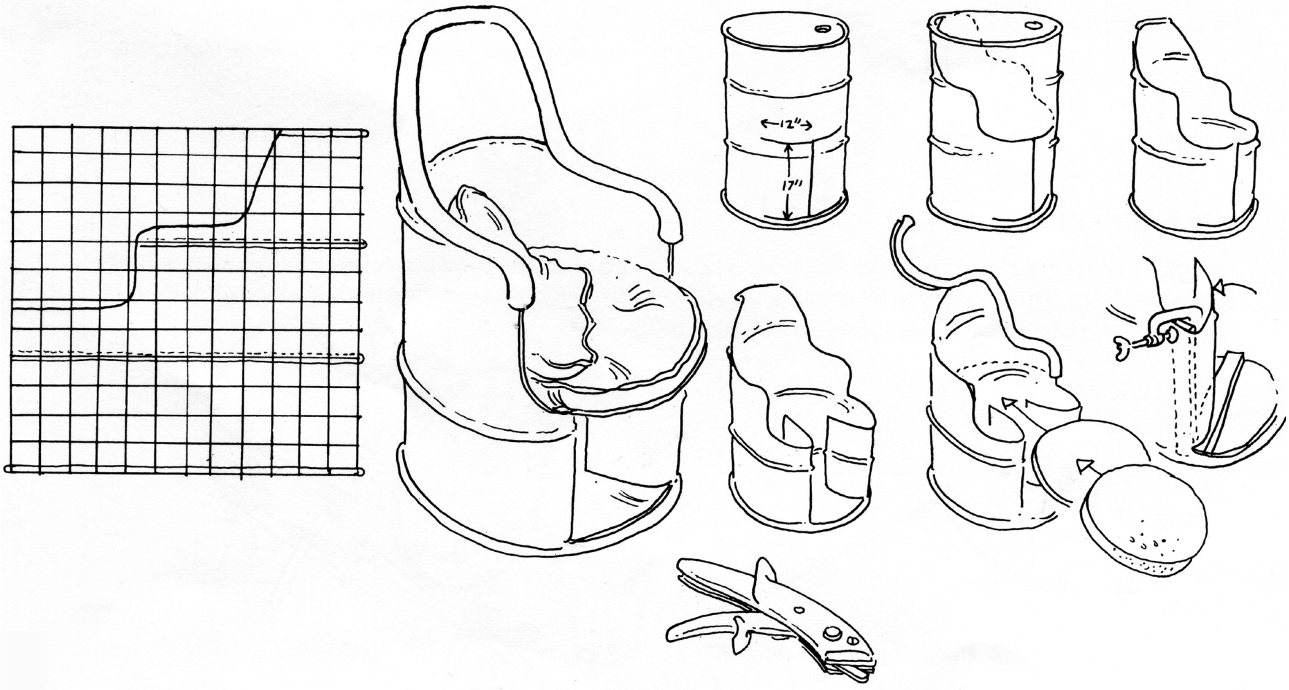
Cutting the drum. Drill hole in waste part of drum to begin cutting. An electric jigsaw (with tungsten carbide bit) works well but makes a deafening noise. A rotary metal cutting bit on an electric drill is more efficient, but equally noisy. A sharp chisel.and hammer is hard work, noisy and leaves a jagged edge. My preferred tool is a Monodex nibbler (see drawing), costing about £7. It cuts straight, takes curves well and doesn't need practice. Cut through the drum lip with a hacksaw. File metal edges smooth. Hammer down cut lip at base.

Folding. Clamp wood inside drum as in drawing; wedge it in place at base with another batten. Fold back the flap. Repeat on second flap.

The seat. The seat rests on three bolts, pushed through holes drilled in the drum. To get drill started and to stop it slipping, make a dent with a hammer and nail.

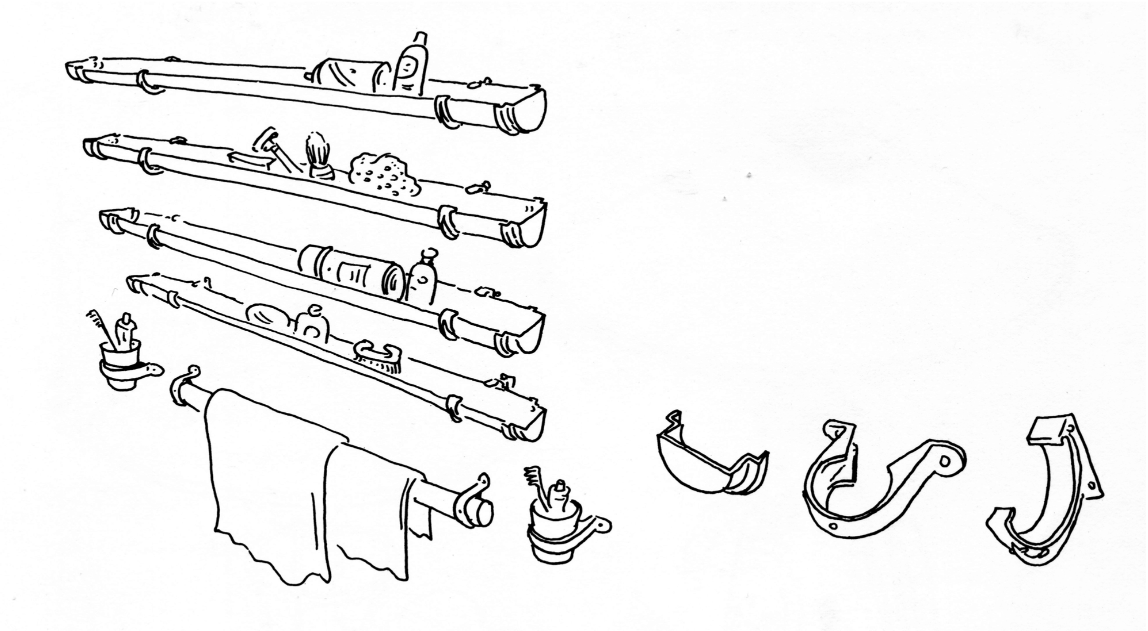
Cutting a circular piece of wood is hard without an electric jigsaw — alternatives are a coping saw or cutting off corner after corner to make a rough disc, finishing off with a file. To mark circle, stick two pins through card, 11in apart. Push one pin in centre of wood and use other pin to score circle.

Glue pipe insulation foam or rubber on outside edges for protection.



BATHROOM FITTINGS

The shelves are 36in lengths of standard PVC guttering, fitted with push-on end caps and held on PVC brackets. The towel rail is a length of 1 ½in PVC pipe, and a standard clamp holds the toothbrush mug. You can paint the grey PVC with emulsion paint.



THE SLOT SEAT

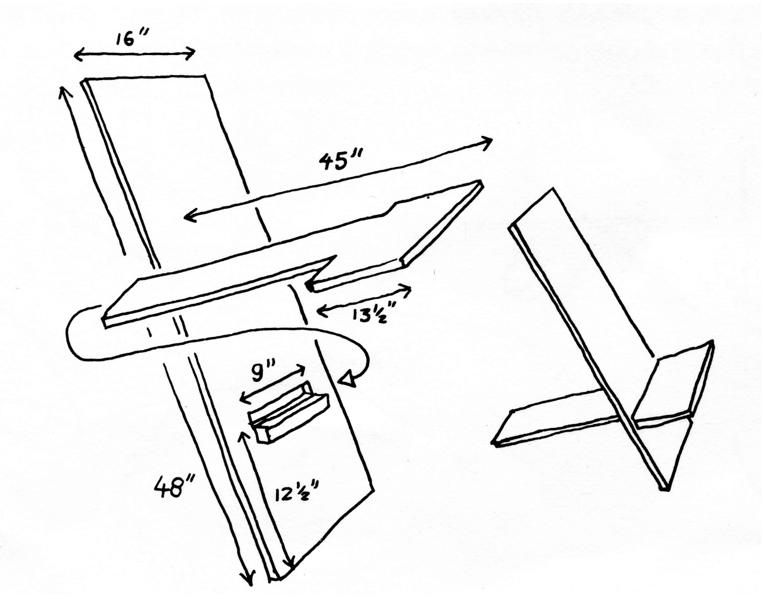
Materials	*Source*
Two plywood planks 48 × 16in	Skip (very expensive to buy)
Hardwood block 9 × 2 × 2in	skip; old furniture
Two bolts 3in long	
Woodworking adhesive	

This chair from Programme 3 is an adaptation of an ancient design seen in India and all over Africa. The best wood to use is 11/4in-thick hardwood planks, but that costs too much and is a rare find in a skip. With plywood, the reinforcing block is needed to prevent splitting.

Mark and saw the boards to shape, as in drawing.

To cut the hole, mark it out and drill holes at opposite corners big enough for the saw to enter. You can cut with a jigsaw, coping saw or hacksaw blade.

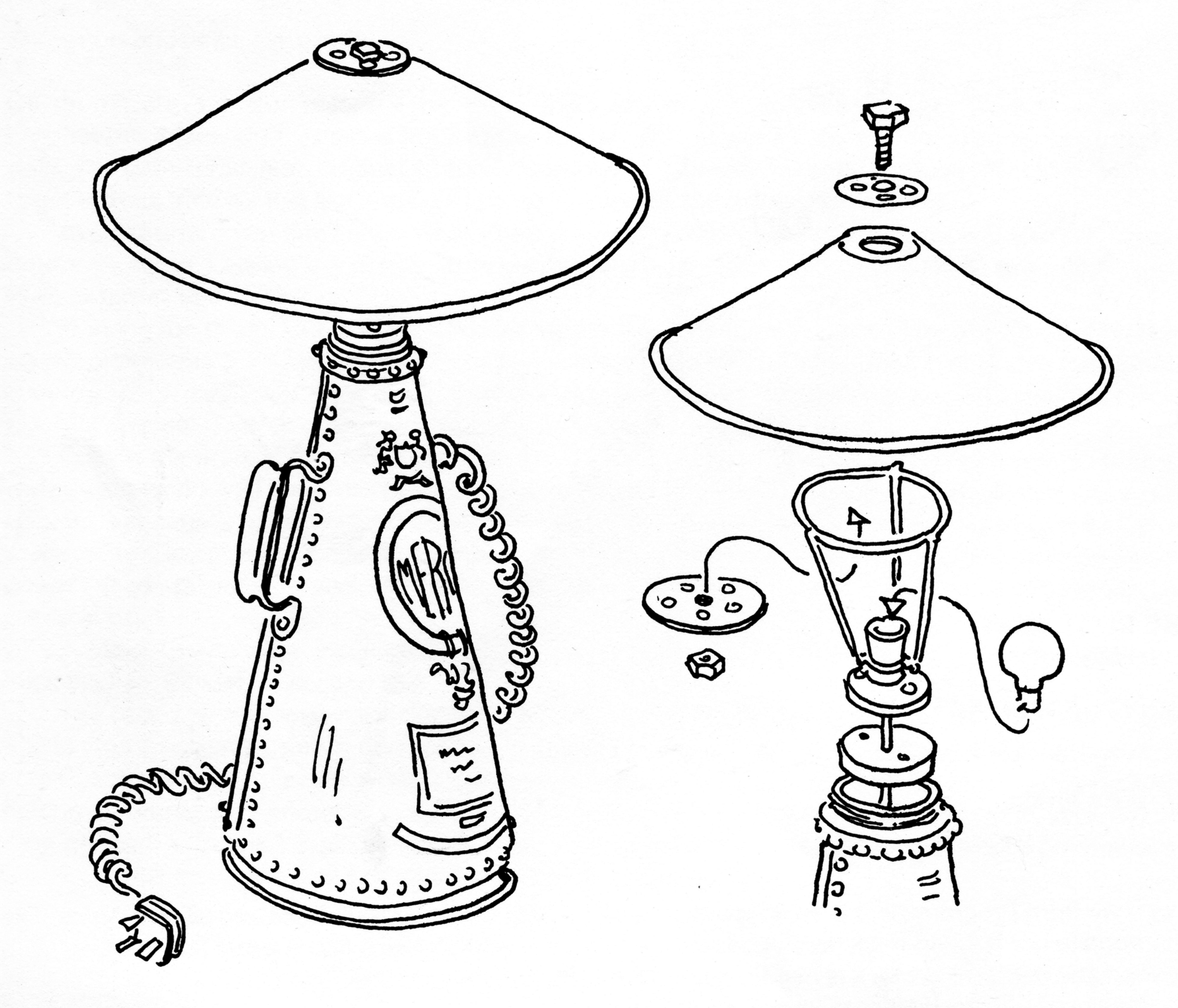
Drill two holes through the block and chair back so the block sits directly under the hole. Smear adhesive on the block and bolt it into position. Wipe away oozing glue with wet rag before it dries.



PAUL COX'S FIRE EXTINGUISHER LAMP

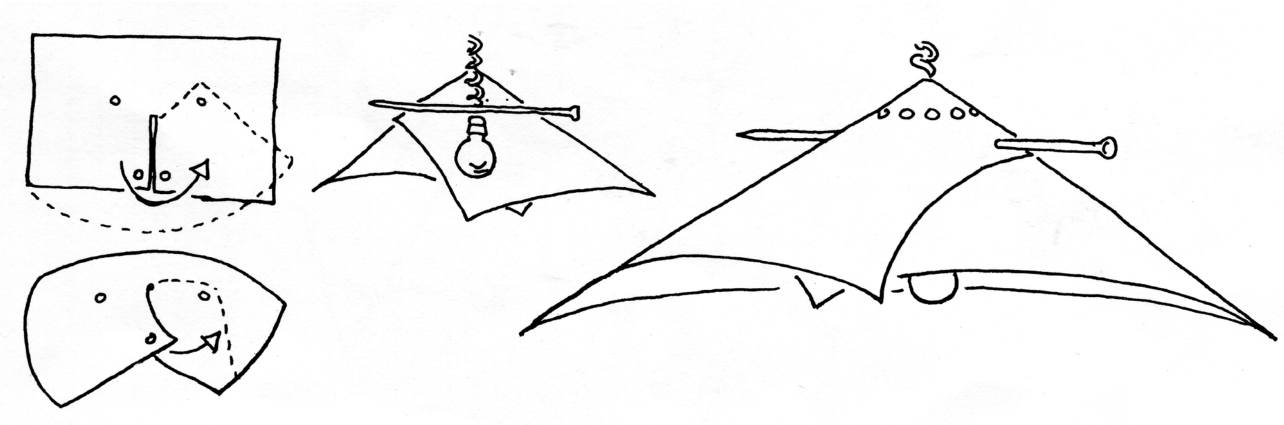
These handsome fire extinguishers are thrown out when firefighting systems are modernised. The conical shape gives the lamp stability, and there's a handy handle for carrying it about. The spout is convenient for the flex.

Cut a disc of plywood to fit tightly in the top, and drill a hole in the centre for the flex. Screw a bulb holder to the disc. Mount shade as in drawing.



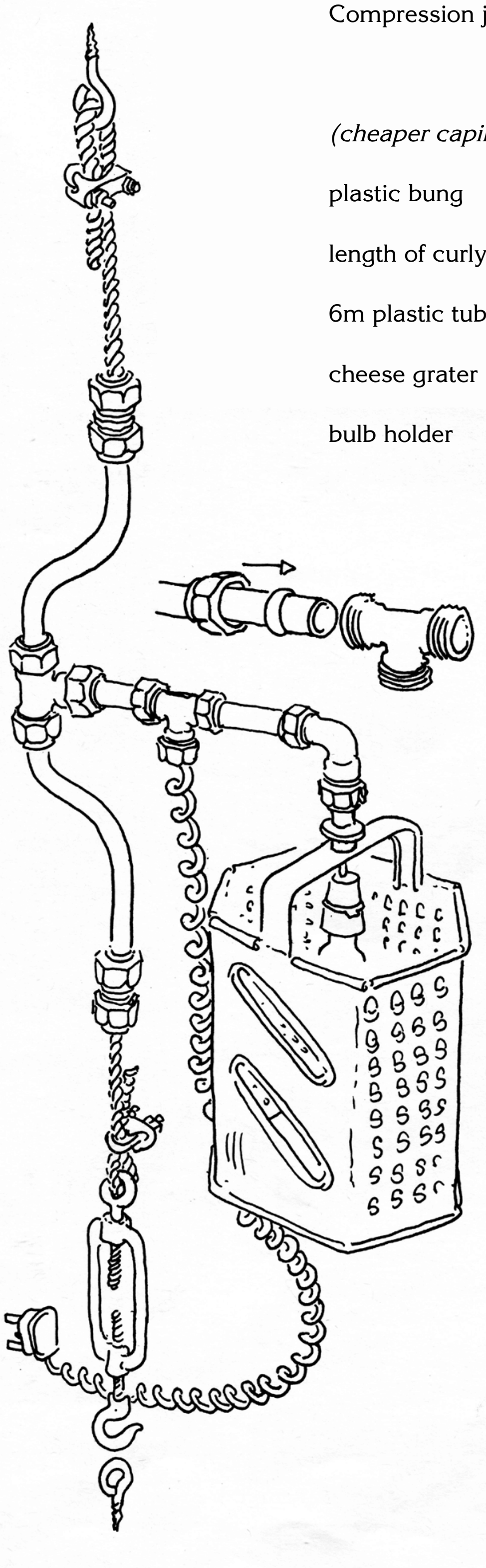
THE PAPER SHADE

The paper shade from Programme 3 is made from a sheet of standard A2-size paper. From the centre of onelong side, cut 1/3 the way across the paper. Pierce two holes near the cut edge and a ring of ventilation holes as shown. Pierce two holes '/3 the way in from the centre of each short side. Twist the paper into a cone around the light flex and push a knitting needle through the pierced holes. Tape the needle to the flex to keep it well clear of the bulb.



THE CABLE LIGHT

Materials		***Source***
Cable to stretch from floor to ceiling, plus 12in		Skip; construction site; scrap yard; boat chandler
Two large eye screws		hardware shop
Turnbuckle with hook		boat chandler
Two cleats		boat chandler
Minimum 24m (600mm) of 15mm copper tube		offcuts from plumbing job; skip
Compression joints	1 elbow coupling 2 T junctions 2 straight couplings	
(cheaper capillary fittings are an alternative)		
plastic bung		bottle-lamp adaptor cut to fit
length of curly flex		
6m plastic tubing		
cheese grater		
bulb holder		



The vertical cable takes a bend through the tubing, creating enough friction to hold the lamp in any position, even if the cable isn't very taut. With any electrical job, safety is crucial: flex must not touch metal — that means plastic tubing where flex goes through pipe.

Bend tube over knee before cutting it to length — it's easier. Use a pipe-bending spring or fill pipe with sand to prevent kinks at joints. Cut pipe with a hacksaw. Smooth ends with file or knife. Assemble joints as in drawing.

Push plastic tube inside pipe to protect flex. Pierce hole through centre of grater handle. Shape plastic bung with knife — it goes up into elbow coupling and down through grater handle.

Spray grater matt black (optional).

Connect bulb holder.

Slip tube over cable. Attach cable to floor and ceiling, where eye screw must be driven into joist, not just plaster. A heavy weight will replace turnbuckle and eye screw in drawing.

THE ALFA SEAT

Materials	*Source*
Alfa Romeo GTV seat	Car scrap yard — or possibly cheaper — car being broken for spares by owner (regular ads in "Exchange & Mart")
Box sides: offcuts of ½in plywood or thicker planks — two pieces 48 × 7in would be enough	skip
Box corners: four blocks 6 × 2 × 2in	skip
Runners: two boards 12½ × 2 × 1in	skip
Two nuts and bolts for seat runners	
Sixteen 1½in screws	
Woodworking adhesive	

The Alfa Romeo seat is too stylish to scrap. The box stabilises it and improves comfort by raising it off the floor. Our box is 7in high. The seat runners sit just inside the box sides, so measure the seat runners to get your box width. Notice that the box ends are lower than the sides; the wooden runners sit on them — for runners ½in thick, set them ½in lower, 1in lower for inch-thick boards.

Mark out the box sides and saw them to shape.

Mark the box ends using a square and saw them to length.

Saw the corner blocks to length.

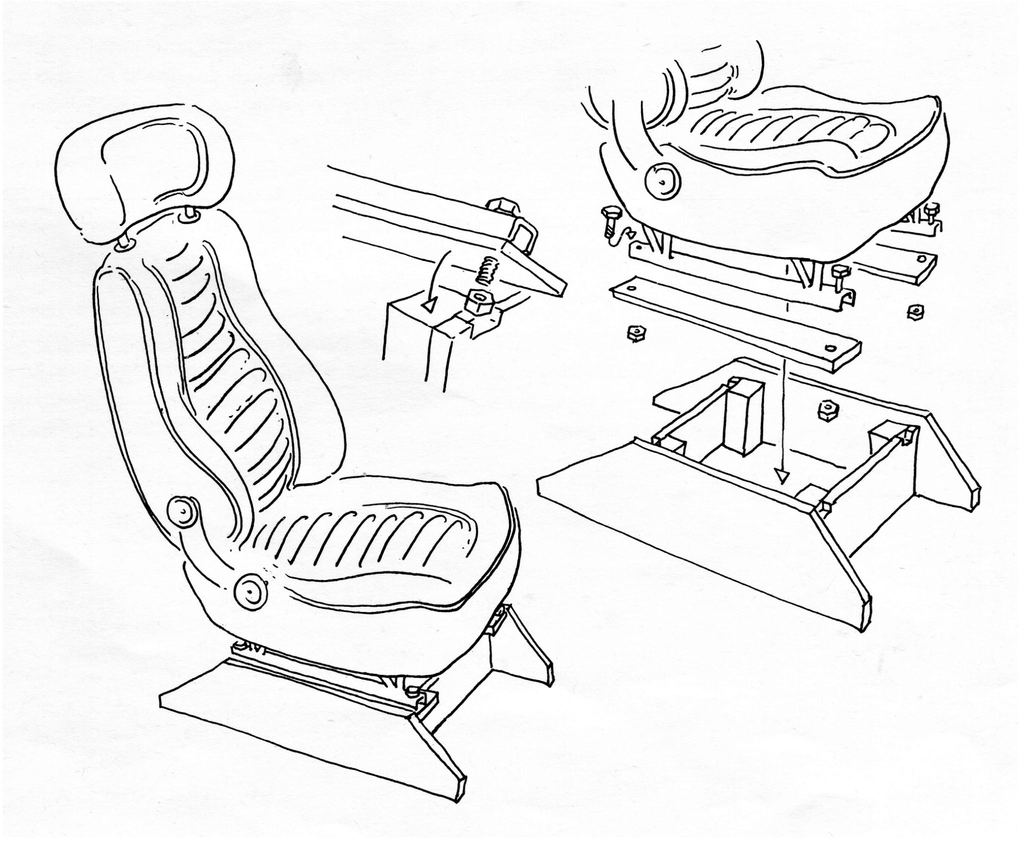
Glue and screw (or nail or dowel) two legs to each box end, taking care to line everything up.

Fix on the sides in the same way.

Sit the wooden runners in the box, place the seat in position and mark where bolt holes should be. Drill holes for bolts and bolt runners to seat.

Cut out grooves in the box for the bolt heads if necessary.

Assemble the seat and screw or dowel through the box sides into the runners.



LOW
TECH
by Rick Ball

AHG 85